PHG4TrackKalmanFitter: DCA comparison Primary Track Fitting

Michael McCumber(LANL),
Jin Huang(BNL),
Xiaorong Wang(NMSU),
Haiwang Yu (NMSU)

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Summary

Progress:

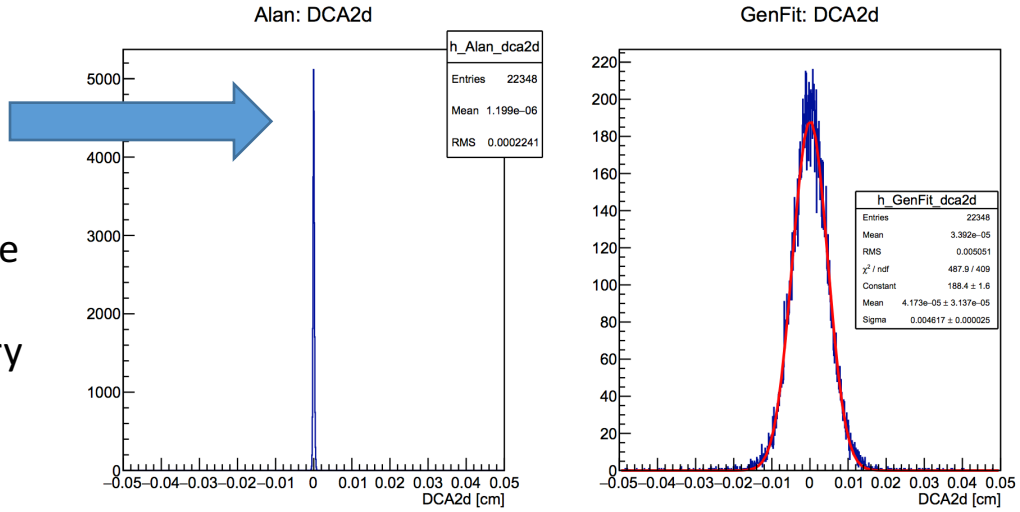
- Single track DCA2d resolution compared with PHG4HoughTranformation results using circle trajectory method in MIE setup.
  - Similar performance.
  - Better evaluation program.
- Primary track refitting implemented in PHG4TrackKalmanFitter.

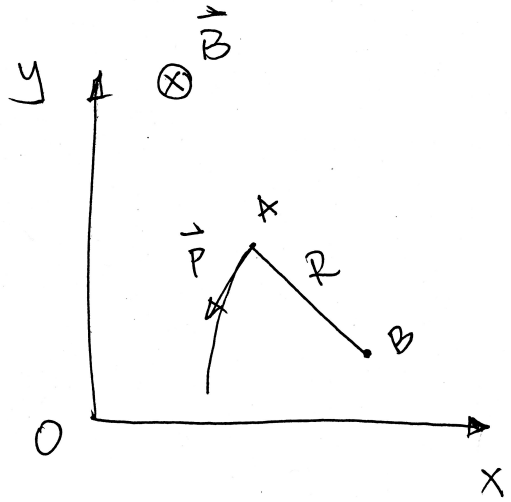
Next:

- Evaluate this PrimaryTrackMap node with external smeared vertex.
- Evaluation multi track simulation with truth particle matching for each track.

Single track DCA comparison

- By default, Alan's single track DCA looks strange.
- So to make reasonable comparison between Alan and GenFit, we need to use same calculation method.
- In these slides, I simplified helix trajectory to a circle.
- Then DCA2d is defined as OB – R

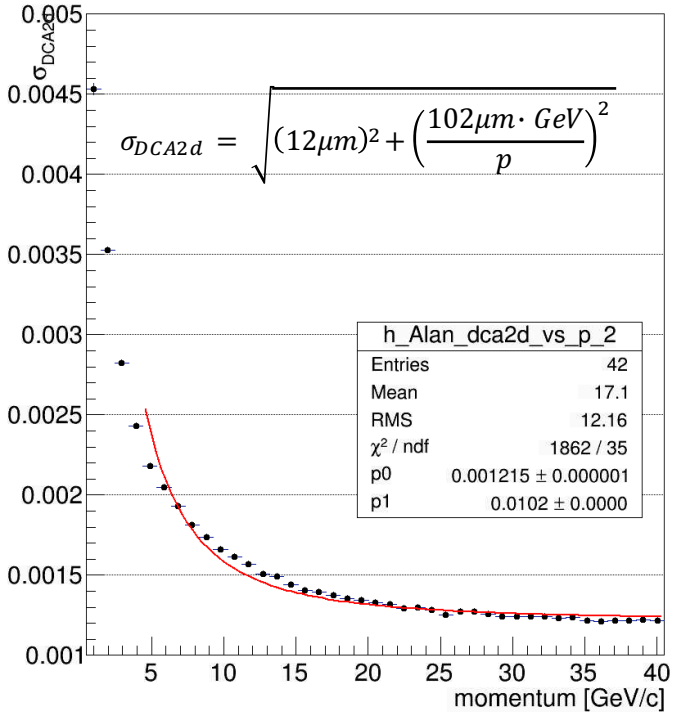




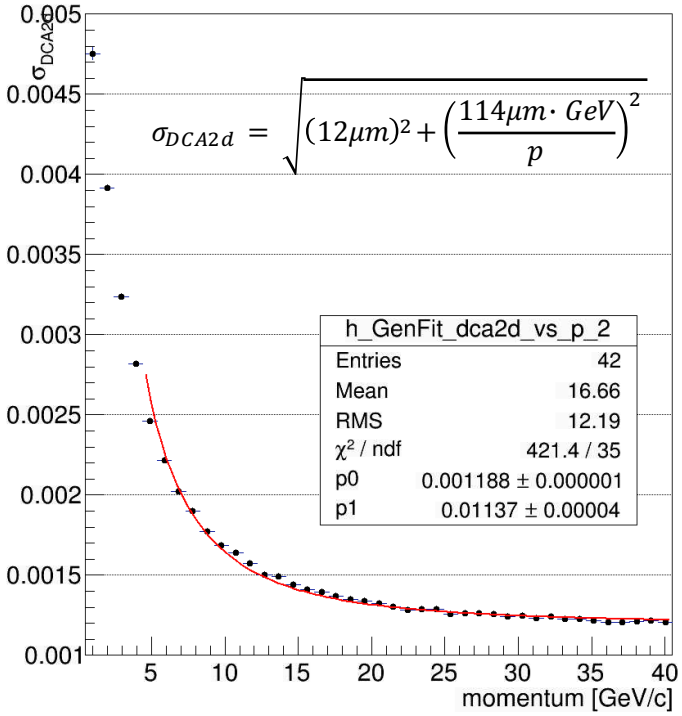
Single Track DCA2d vs. pT_True

- single pion simulation in MIE setup
- from vertex (0,0,0)
- -0.5 < eta <0.5
- 1 < pT < 40 GeV

Alan: σ_{DCA2d}



GenFit: σ_{DCA2d}

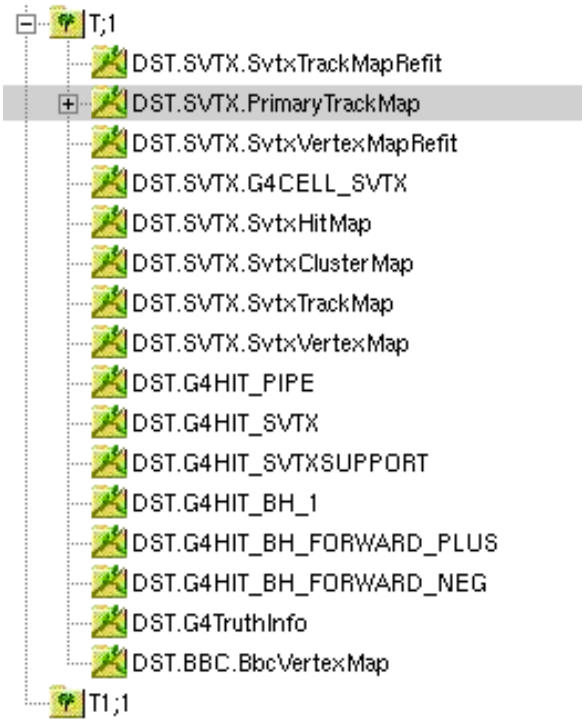


Primary Track: refitting with vertex

- Refit tracks with vertices.
  - Use measured clusters + reco'd vertex
  - Add PHGenFit::SpacialMeasurement to the track
  - pos, cov from vertex fitting

- New "SvtxTrackMap" Node "PrimaryTrackMap" will be made with PHG4TrackKalmanFitter::set_fit_primary_tracks(true) option.

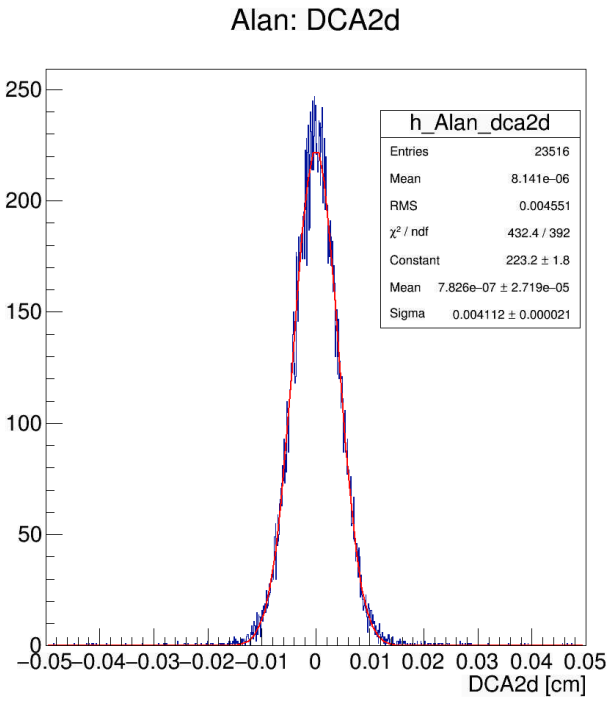
- Haven't got time to test. For the first step, I will evaluate this new node with single track simulation and external smeared vertex input.
  - The smearing will mimic high multiplicity events.

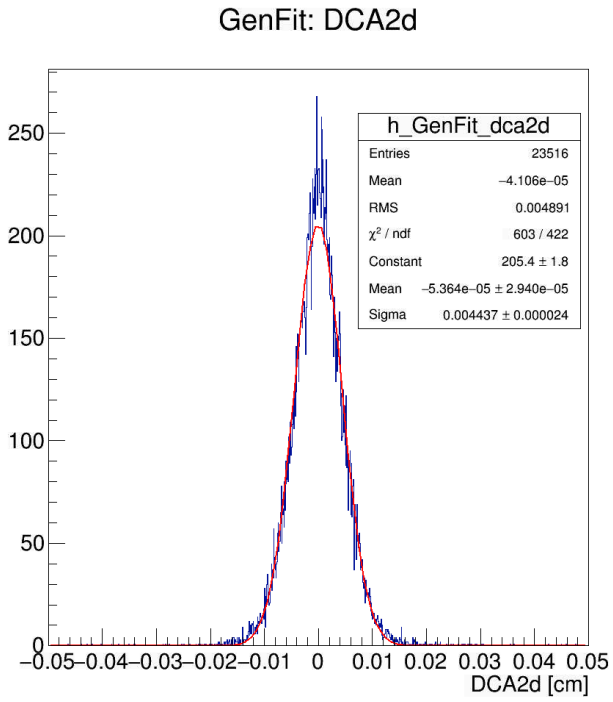


Backups

DCA2d (Circle trajectory method)

Single track DCA2d for 1 < pT < 2 GeV





Vertexing resolution, Alan vs. RAVE